Model-based Design of Embedded Software

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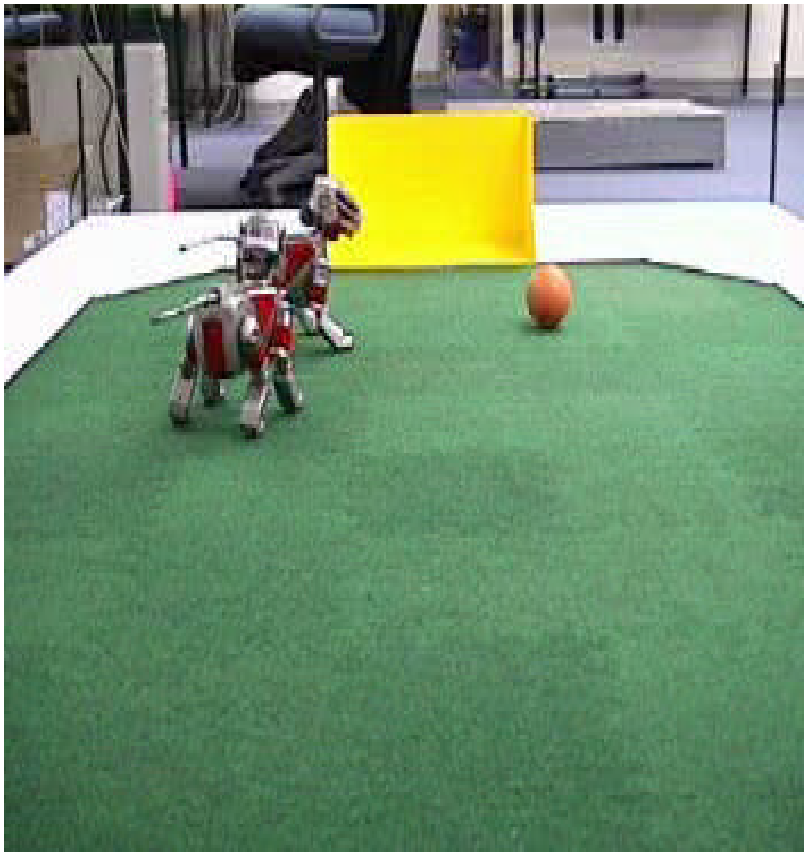
Programming Interacting Autonomous Robots

Low level

- Analysis of vision data
- Control laws for legs
- Wireless cards



Current programming

- How to implement Go-to-ball
- Real-time scheduling

High level

- Modes: Attack, Defend
- How to switch? Strategies
- Communication to collaborate

Promising Trends

- **Model-based Design**
  - Visual, Hierarchical, Object oriented notations/tools for control software (UML…)
  - Enhancements to control engineers' tools (Stateflow in Matlab)
- **Formal modeling and verification**
  - Model checking as a debugging tool
  - Combining program analysis and model checking
  - Hybrid systems (discrete + continuous, formal methods + control theory)
  - Foundations for compositionality, refinement …

Guiding Themes

- Integrated modeling of control program and physical environment
  - Programming language technology in Control tools
  - Continuous modeling in Programming environments
- Bridging the gap between models and code
  - Code generation or model extraction?
- Middleware for embedded applications
- Is tomorrow's legacy code better than today's? Behavioral interfaces